

ART 34 AMDT

10/502450

DT15 Rec'd PCT/PTO 23 JUL 2004

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Claims

1. Heat integrated distillation column comprising a cylindrical outer shell having an upper and a lower end and at least one first inner volume and at least one second inner volume in the shell, and being in heat exchanging contact with each other through a wall separating the volumes, the improvement comprising providing means having heat exchanging capacity extending through the said wall from said at least one first volume into said at least one second volume, whereby the inside of the said heat exchanging means is in open fluid connection with the said first volume.
2. Column according to claim 1, wherein the said column is provided with an inner tube which is concentric with the outer shell, thereby defining a volume inside the inner tube and an annular volume between inner tube and outer shell.
3. Column according to claim 1, wherein the said first and said second volume have been created by a separating wall extending along the inside of the outer shell, and connected at both ends to the outer wall.
4. Column according to claims 1-3, wherein said first volume is constructed to act as stripping section and said second volume as enriching section.
5. Column according to claims 1-4, wherein the heat exchange means are present in the volume that has been designed as the volume with the highest temperature and is in open connection with the volume designed to have the lowest temperature.
6. Column according to claims 1-4, wherein the heat exchange means are present in the volume that has been designed as the volume with the lowest temperature and is in open connection with the volume designed to have the highest temperature.

7. Column according to claims 1-6, wherein vapour disengagement means are present, preferably selected from the group of fins, vanes, corrugated structured packing sheet and dumped packing rings.

5 8. Column according to claims 1-7, wherein the both volumes are provided with trays and downcomers.

9. Column according to claims 1-7, wherein the enriching section is provided with trays and downcomers and the stripping section is provided with structured or random packing.

10 10. Column according to claims 1-7, wherein the stripping section is provided with trays and downcomers and the enriching section is provided with structured or random packing.

11. Column according to claims 1-7, wherein both the stripping section and the enriching section have been provided with a structured and/or a random packing.

15 12. Column according to any one of the claims 1-11, wherein the said heat exchange means comprise a panel or a tubular construction, preferably corrugated sheets oriented in vertical direction, coils, flat plates, dimple plates or tubes, finned plates or tubes or other plates or tubes that enhance heat transfer.

20 13. Column according to claims 1-12, wherein a plurality of said means having heat exchanging capacity is present along the length of the column.

14. Column according to claims 1-13, wherein the said means having heat exchanging capacity are located in the downcomer of a tray.

25 15. Column according to claims 1-14, wherein the heat exchagne means are located between the trays.

16. Column according to claims 1-15, wherein the volume of one section increases from the lower end to the upper end and the volume of the other section simultaneously decreases from the lower end to the
30 upper end.

17. Column according to claims 1-16, wherein means are present for providing a pressure difference between the said first volume and the said second volume.
18. Process for distilling liquefied air, organic mixtures or aqueous mixtures, said process comprising applying a column according to claims 1-17.
19. Use of a column according to claims 1-17, for distillation.